Articles

THE extraction and refining of germanium and gallium†

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ABSTRACT

Sources of germanium and gallium are discussed and descriptions are given of processes for the recovery of these elements from flue dusts and from germanite. The flue-dust process involves smelting to recover the rare elements in a metallic regulus, dissolution of this regulus in ferric chloride solution with the aid of chlorine, distillation of crude germanium tetrachloride from the resulting solution, fractional distillation of the crude product to remove the bulk of the arsenic, and final rectification through a column packed with copper turnings to remove the remainder. After hydrolysis of the resulting tetrachloride germanium oxide is obtained with less than 0.1 p.p.m. of arsenic. Gallium is recovered from the acid liquor in the first still by treatment with aluminium to remove heavy metals and to reduce the iron to ferrous chloride, followed by extraction of the gallium chloride in a continuous process with *iso*propyl ether, removal of the ether by distillation, purification of the aqueous phase with hydrogen sulphide, and conversion of the gallium into sodium gallate for electrolysis.

The germanite process is a modification of that recommended by Sebba & Pugh (1937), combined with similar refining stages to those used in the treatment of flue dust.

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